

**Amendments to the Specification:**

Please replace paragraphs [0009], [0010], and [0016] with the following amended paragraphs:

[0009] It has now been discovered that composites of silicon nitride and silicon carbide can be densified to a high degree, comparable to that obtained with the metal oxide densification aids of the prior art, by a process that involves either no densification aid or a much reduced amount of densification aid, to achieve a product that sharply reduces or eliminates the degradation in creep behavior observed in composites of the prior art. This result is achieved by forming an amorphous mixture of silicon nitride and silicon carbide powders in an inert environment, subjecting the mixture to mechanical activation by high-energy ball milling, then consolidating and densifying the powder mixture **by compressing the mixture while passing an electric current through it, to achieve a fused mass of silicon nitride and silicon carbide crystals.**

**The consolidation and densification are preferably done** by electric field-assisted sintering, also known as spark plasma sintering. The process results in a composite whose microstructure consists of nano-sized silicon nitride grains and nano-sized silicon carbide grains, with essentially no glassy phase or a glassy phase of such small proportions that it does not contribute significantly to the creep behavior of the composite. The composite thus has the highest creep resistance as a function of temperature and stress reported so far. These and other objectives, features, and advantages of the invention will be apparent from the description that follows.

[0010] While any silicon nitride and silicon carbide powders of the appropriate particle size can be used in the practice of this invention, one means of obtaining such a powder mixture is by the pyrolysis of any of a variety of polymeric precursors that contain silicon, carbon, and nitrogen. The conversion of these precursors to powder mixtures is preferably achieved by first crosslinking the polymer, then pyrolyzing the crosslinked polymer to an amorphous solid of silicon, carbon and nitrogen, and finally comminuting the amorphous solid to a powder consisting of particles in the micron-size, sub-micron-size, or nano-size range, **preferably less than 100 nanometers in diameter.** These steps are preferably performed in an inert atmosphere such as nitrogen, argon, or any non-oxidizing gas to avoid or minimize the presence or formation of silicon dioxide.

[0016] The amorphous powder mixture is mechanically activated by high-energy ball milling. This is likewise achieved by methods known in the art and is typically performed in centrifugal or planetary mills that apply centrifugal and/or planetary action to the powder mixture with the assistance of grinding balls. The powder in these mills is ground to the desired size by impacts of up to 20 g (20 times the acceleration due to gravity). Variables such as the sizes of the milling balls, the number of milling balls used per unit amount of powder, the temperature at which the milling is performed, the length of time that milling is continued, and the energy level of the mill such as the rotational speed or the frequency of impacts, can vary widely. The number and size of the milling balls relative to the amount of powder is typically expressed as the "charge ratio," which is defined as the ratio of the mass of the milling balls to the mass of the powder. A charge ratio of about 1:1 or greater, preferably about 1:1 to about 10:1, and most preferably about 1:1 to about 5:1, will generally provide the best results. **A charge ratio of at least about 10, and preferably from about 10 to about 20, can also be used.** Preferred milling frequencies are at least about 3, and preferably about 3 to 30 cycles per second or, assuming two impacts per cycle, at least about 6 or preferably about 6 to about 60 impacts per second. A presently preferred frequency is about 20 impacts per second.